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(56) Documents Cited

GB 2146547 A GB 1436579 A US 4282094 A

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INT CL<sup>5</sup> A47J 37/12

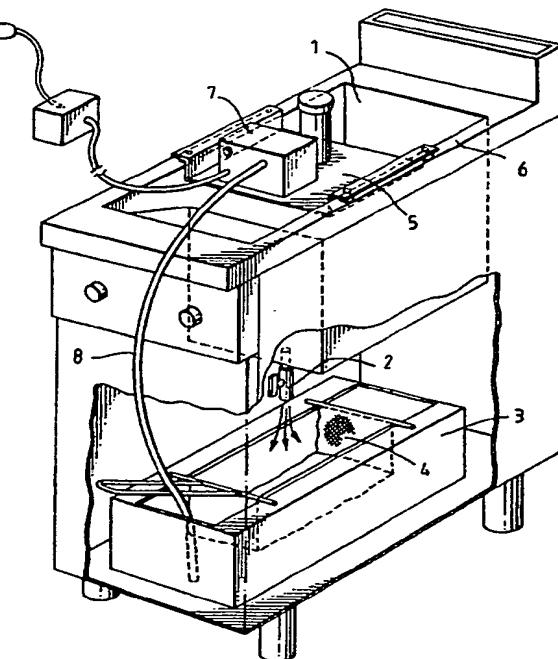
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## (54) Apparatus for filtering the oil of a fryer

(57) Fryer machine provided with a frying vat 1, an opening 2 for discharge of said vat into a subjacent collection tank 3 provided with a filtering element 4 which is preferably removable, and a base 5 which can be removably fitted to the upper edges 6 of said frying vat, said base supporting a pump 7 to which there are connected a suction intake conduit 8 for drawing in the oil from the bottom of the collection tank and a delivery conduit (9 Fig. 3) for passing the oil which has just been drawn in, into said frying vat.

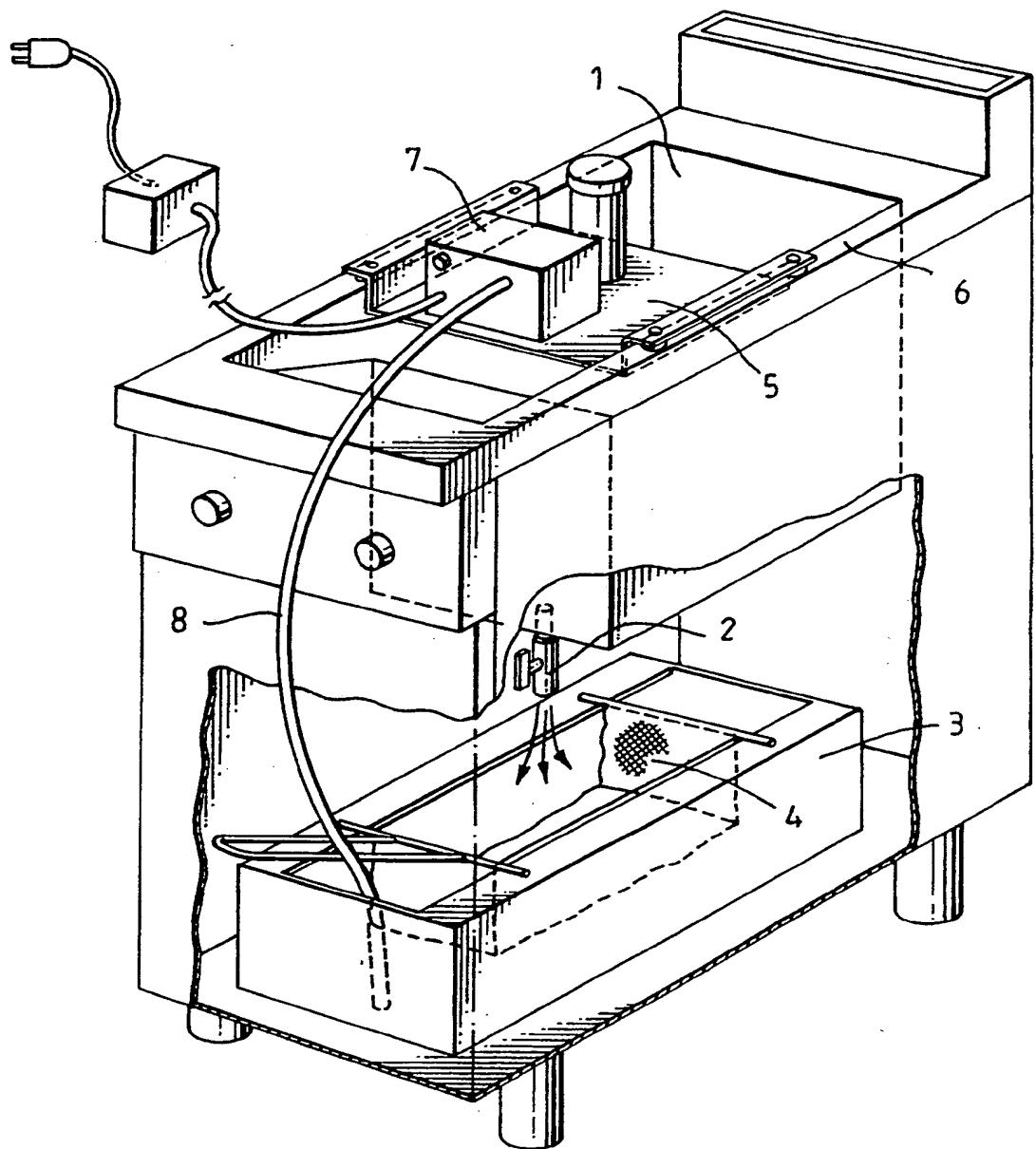
The edges of the base 5 are adapted to couple exactly with the upper edges 6 of the frying vat and the base is further provided with a filter element (11, Fig. 3) preferably of interchangeable cartridge type, disposed downstream of said pump and arranged in a fixed manner on said base.

Fig.1.



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Fig.1.



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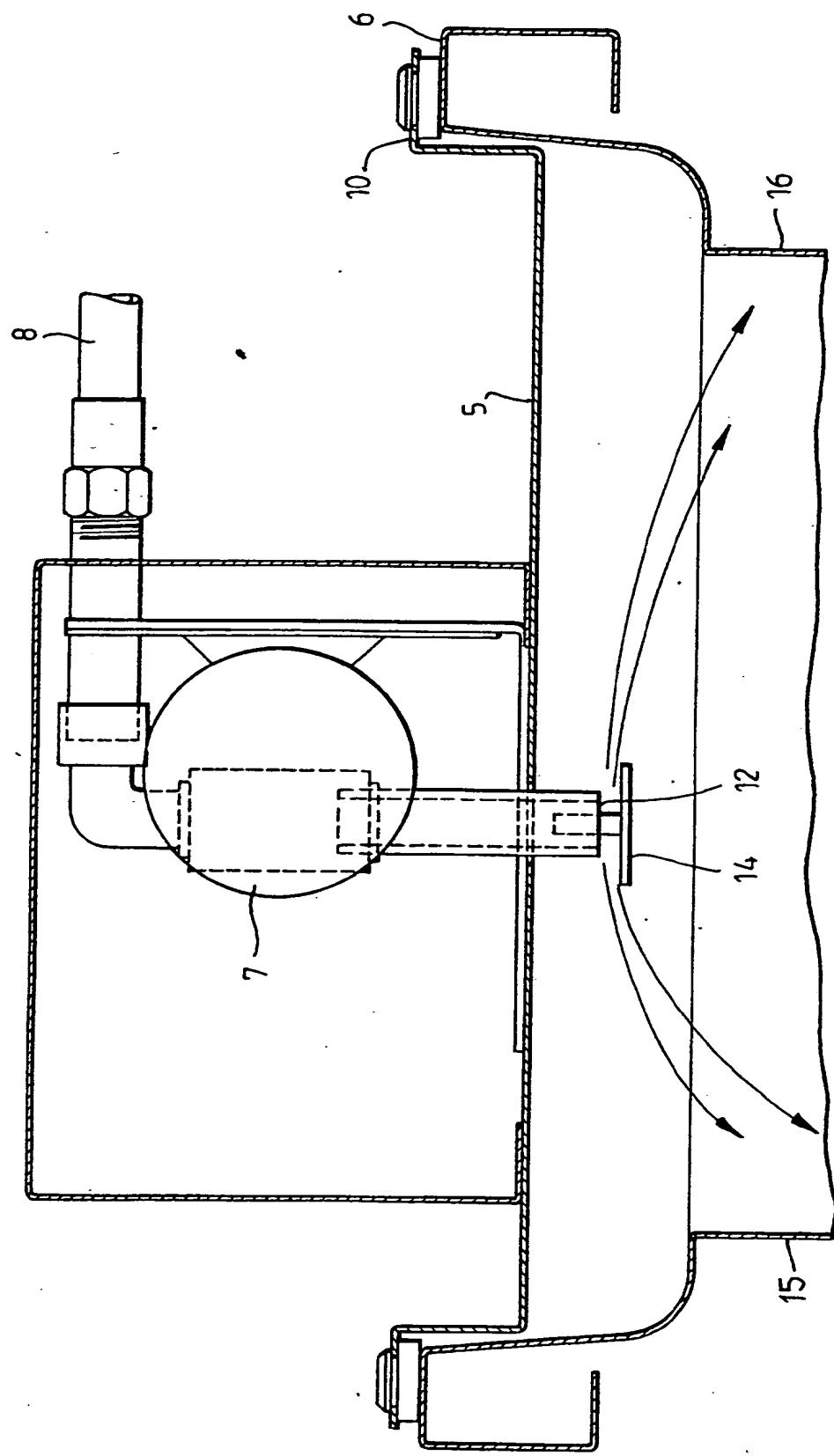
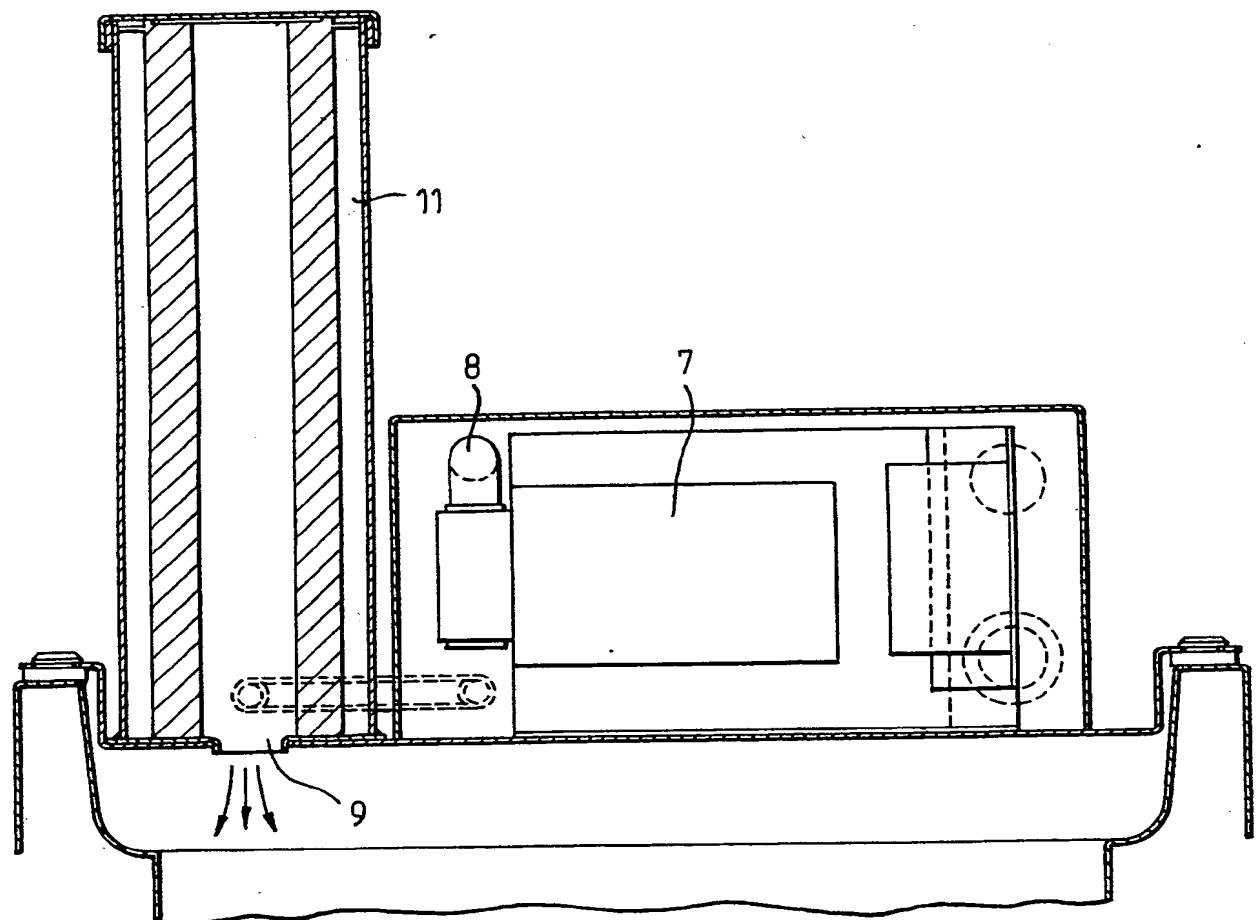


Fig.2.

Fig.3.



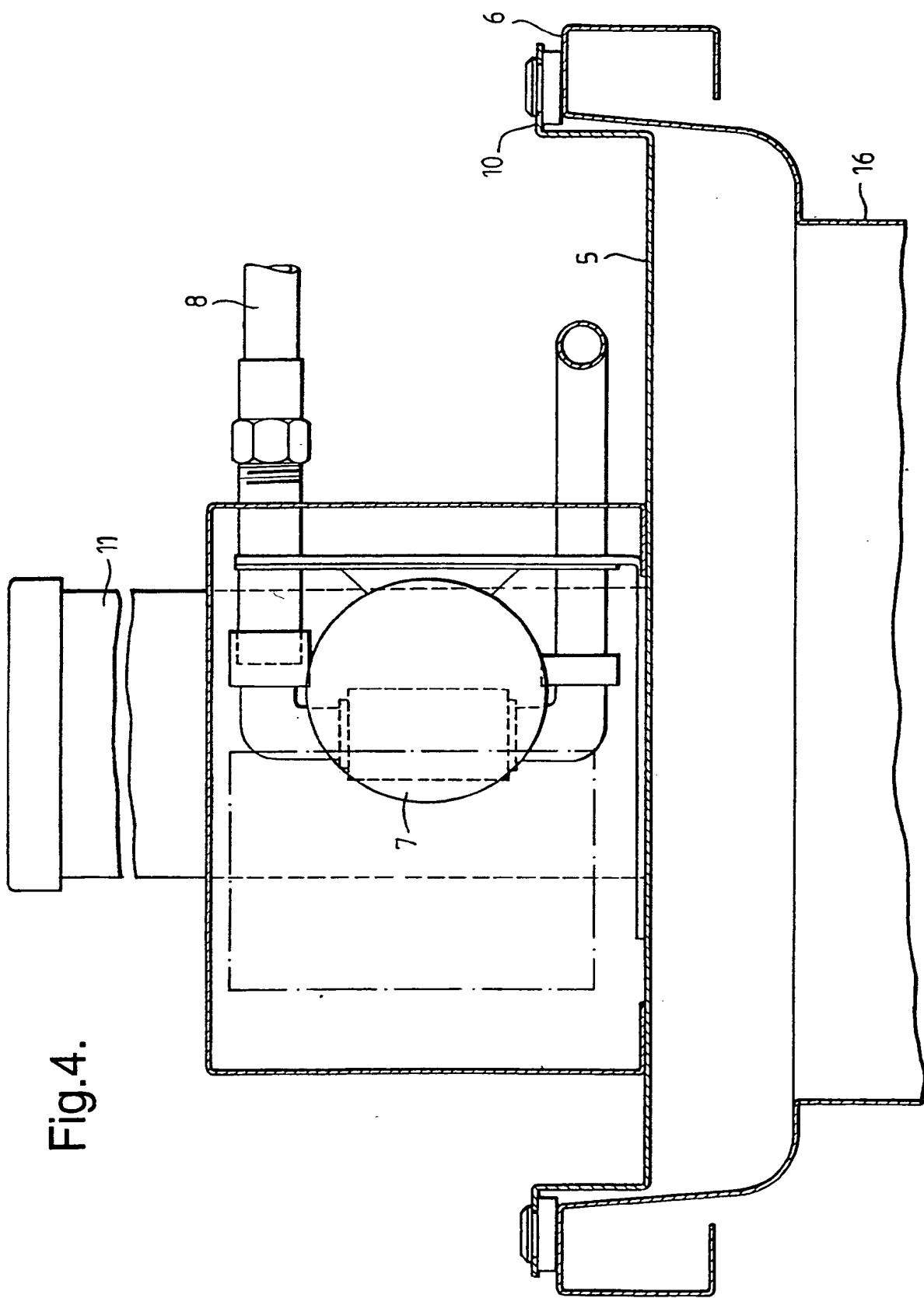


Fig.4.

## APPARATUS FOR FILTERING THE OIL OF A FRIER

The invention relates to improved apparatuses for filtering the oil of a food frier, in particular for use for  
5 the general public.

It is known that special machines which are referred to as 'friers' are used for frying foods in oil for serving considerable numbers of people.

The characteristics of the frying process are well  
10 known and will not be recalled here; it will be noted only that the oil used for frying progressively loses its properties because of three factors: the first factor is oxidation of the oil which is caused by the high temperature attained, the second factor is the production of volatile  
15 carbonyl compounds which cause hardening of the oil and the formation of unpleasant odours, and the third factor is progressive contamination of the oil which in use collects in suspension impurities, deposits or burnt fragments which come away from the food. It would be expedient for the oil  
20 used for frying to be replaced after a certain limited period of use but it is found that it is possible to extend use of the oil and thus the useful life thereof if steps are taken to eliminate one of the above-mentioned factors in its deterioration, namely the progressive collection of  
25 impurities in suspension therein.

For that purpose it is a common practice habitually to effect filtering of the oil, and the filtering operation can be carried out by means of suitable apparatuses which are sometimes connected to and sometimes  
30 separate from the frier machines.

In general, the filtering process is carried out by causing the oil to drain under the effect of gravity from the cooking vat into a suitable subjacent mechanical filter from which the oil is collected in a lower bowl or tray.

From there the oil is re-introduced into the frying vat by means of suitable conduits and an appropriate pump which recirculates the oil from the lower tank to the cooking vat.

5 That recirculation procedure can be carried on in various known ways: a first method involves fitting to the lower tank of the frier an electric pump provided with a lower tube for the suction intake of the oil and an upper tube for delivery of the oil to the cooking vat, whenever 10 there is a wish to carry out the filtering procedure.

That method suffers from a double disadvantage: the first is that the flexible tube for re-introducing the oil into the vat is the delivery tube and if it runs away from the control system or if it breaks or splits

15 unexpectedly it can cover the operator with boiling oil; in addition it is necessary to bear in mind the difficulty and the inconvenience involved in securely positioning the pump below the frier and the associated conduits each time that the oil is to be filtered.

20 A second method uses a movable carriage equipped with the filter, the lower tank, the pump and the conduits for suction intake of the oil and delivery thereof into the tank.

25 Normally the use of such a moveable carriage is more secure since it is finalised precisely only at the time of the filtering operation, but that requires the use of additional equipment with all the disadvantages and burdens that this involves.

30 A third method which is used in the art is similar to the first method, with the difference that the pump and the conduits are installed fixedly rather than removably.

35 That gives rise to rigidity of commercial type in regard to the associated friers which must include such apparatuses even if the filtering operation is not effected or is effected using other methods which are not described.

The aim of the present patent is to eliminate the above-described disadvantages, providing the frying machine with suitable apparatuses without the need for major structural modifications involving the machine itself.

5 According to the present invention, there is provided a frier machine provided with a frying vat, an opening for discharge of said vat into a subjacent collection tank provided with a preferably removable filtering element, a base which can be removably fitted to the upper edges of said frying vat, said base supporting a pump to which there are connected a suction intake conduit for drawing in the oil from the bottom of said collection tank and a delivery conduit for passing the oil which has 10 just been drawn in, into said frying vat.

15 The invention will be better appreciated from the following description given solely by way of non-limiting example and with reference to the accompanying drawings in which:

20 Figure 1 is a diagrammatic perspective view of a frier machine incorporating the apparatuses according to the invention;

Figures 2 and 3 show two detailed views of two particular features of the invention; and

25 Figure 4 shows an improvement according to the invention.

Referring to the drawings, diagrammatically shown therein is a frier machine provided with a frying vat 1, and an opening 2 for discharge of the vat 1 into a subjacent tank 3 provided with a filtering element 4.

30 The invention comprises a base 5 which can be removably fitted to the upper edges 6 of the frying vat 1, the base serving as a support for an electric pump 7 to which are connected a suction intake conduit 8 which picks up the oil from the bottom of the lower collection tank, and

a corresponding delivery conduit 9 for the re-introduction of the oil into the frying vat.

The advantage of that configuration depends on the fact that the edges 10 with which the base if provided and the upper edges 6 of the frying vat are shaped in such a way so to be exactly coupled, so that it is not possible to displace the base accidentally to such an extent as to cause it to fall into the vat or to cause it to fall outside same, but the base can only remain in the correct operating position above the vat, even if it is subjected to accidental knocks.

The suction intake conduit can thus be any flexible tube without adversely affecting the reliability of the filtering procedure; in fact, even if the tube accidentally comes out of the bottom of the collection tank, there would not be any leakage or spraying of oil since the tube operates in a suction mode.

In addition the raised position, which is stabilised by the matched profile of the edges of the base 5 ensures that the delivery conduit is always directed towards the interior of the tank, in a downward direction, eliminating any possibility of the oil pouring or being lost to the exterior of the vat.

An advantageous improvement of the present invention involves installing an additional filter element 11 on the same base.

The element 11 is preferably disposed downstream of the pump and must be installed fixedly relative thereto, even if not necessarily in contact therewith, in order to be able to ensure a safeguard against possible oil leaks.

Another useful improvement of the invention lies in disposing in front of the outlet nozzle 12 of the delivery conduit 9 a deflector 14 which is shaped and disposed in such a way as to intercept the outlet jet of oil

and to divert it towards the opposite walls 15 and 16 of the vat.

Desirably the deflector 14 is fused to the lower part of the base 5 and operates as follows: during the discharge flow of oil from the nozzle, the oil is diverted by the deflector towards the walls of the vat by virtue of the pressure of the pump and by striking the walls with sufficient force effectively washes therefrom the frying residues which are normally deposited on the walls.

Since the base is made in such a way that it can slide on the upper edges of the vat, the operator can manually move the position of the base forwardly and rearwardly so that the diverted jets of oil strike against and thus wash progressively the walls of the vat over the entire extent thereof, thereby removing the frying residues which are deposited there and automatically filtering same together with the oil, thereby ensuring that such unfiltered residues do not cause fresh contamination of the filtered oil.

Although the invention has been described with reference to the example of the drawings, it can permit and include numerous modifications in regard to structure and shape.

## CLAIMS

1. A frier machine provided with a frying vat, an opening for discharge of said vat into a subjacent collection tank provided with a preferably removable filtering element, a base which can be removably fitted to the upper edges of said frying vat, said base supporting a pump to which there are connected a suction intake conduit for drawing in the oil from the bottom of said collection tank and a delivery conduit for passing the oil which has just been drawn in, into said frying vat.

5 2. A frier machine according to claim 1 wherein the edges of said base are adapted to be coupled exactly to the upper edges of the frying vat.

10 3. A frier machine according to claim 2 wherein said base is further provided with a filter element, disposed downstream of said pump and arranged fixedly upon said base.

15 4. A frier machine according to claim 3 wherein the filter element is of interchangeable cartridge type.

20 5. A frier machine according to claim 2, 3 or 4 wherein said base is slidable along the upper edges of said frying vat.

25 6. A frier machine according to any one of the preceding claims wherein the discharge nozzle of the delivery conduit is provided with a deflector for diverting the jet of oil coming from said nozzle towards the opposite walls of the vat.

30 7. A frier machine constructed and arranged to operate substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

Patents Act 1977  
 Examiner's report to the Comptroller under Section 17  
 (The Search report)

Application number  
 GB 9417105.5

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 Search Examiner  
 DR C L DAVIES

Date of completion of Search  
 16 NOVEMBER 1994

Documents considered relevant  
 following a search in respect of  
 Claims :-  
 1-7

Relevant Technical Fields

- (i) UK Cl (Ed.M) A4D (D7) B1D (DNRD)  
 (ii) Int Cl (Ed.5) A47J 37/12

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE DATABASE: WPI

Categories of documents

- X: Document indicating lack of novelty or of inventive step.
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- A: Document indicating technological background and/or state of the art.
- P: Document published on or after the declared priority date but before the filing date of the present application.
- E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.
- &: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
A	GB 2146547 A	(RENOVAT) see Figures	-
A	GB 1436579	(COLLINGWOOD) see Figure	-
A	US 4282094	(MITCHELL) see Figures 1 and 2	-

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).